

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019
Subject Code:2162304
Date:18/05/2019
Subject Name:Polymer reaction engineering and Rheology
Time:10:30 AM TO 01:00 PM
Total Marks: 70
Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Differentiate between elementary and non elementary reactions.	03
	(b) Explain briefly about melt fracture and die swell.	04
	(c) With a neat sketch explain the batch type of reactor stating suitable advantages, disadvantages and applications.	07
Q.2	(a) Explain the Weissenberg effect.	03
	(b) List the factors affecting the rate of reaction.	04
	(c) Give suitable examples and explain the Non Newtonian fluids.	07
	OR	
	(c) Derive the Arrhenius equation and state its significance.	07
Q.3	(a) What is molecularity and order of reaction?	03
	(b) Explain the creep curve for plastic deformation.	04
	(c) Explain about continuous stirred tank reactor.	07
	OR	
Q.3	(a) Explain stress relaxation.	03
	(b) Discuss about free volume concept.	04
	(c) Explain the Melt Flow Index test with a neat sketch.	07
Q.4	(a) What are Newtonian fluids?	03
	(b) With a neat sketch explain the Kelvin and Voigt model.	04
	(c) What is chemical kinetics? Give detail classification of Chemical reactions with suitable example.	07
	OR	
Q.4	(a) Discuss briefly about rate constant.	03
	(b) Explain the factors affecting Tg of a polymer.	04
	(c) With as neat sketch explain the Maxwell Model.	07
Q.5	(a) Discuss about stereoregular polymers.	03
	(b) Explain the kinetics of free radical polymerization.	04
	(c) The pyrolysis of ethane proceeds with an activation energy of about 300 kJ/m. How much faster is the decomposition at 650 °C than at 500°C? And discuss rate constant	07
	OR	
Q.5	(a) Explain about cone and plate viscometer.	03
	(b) Explain about Power law model.	04
	(c) Define crystallinity and factors affecting crystallinity in a polymer.	07
